

AMENDMENTS TO THE CLAIMS:

Please amend the claims as follows:

1. (Currently amended) A method for the production of totipotent tissue culture of a plant of the Class Monocotyledonae that is selected from a family that is a member of the group consisting of Poaceae, Cyperaceae, Juncaceae, and Typhaceae, the method comprising:

selecting an explant of living tissue from the plant; ~~plant;~~ and
cultivating the tissue on a primary medium which contains an auxin and a cytokinin to produce totipotent tissue; and
transferring the totipotent tissue to a secondary medium containing a cytokinin and cultivating to produce plantlets having roots and shoots.

2. (Cancelled) The method according to claim 1, comprising, in addition: cultivating the totipotent tissue on a secondary medium to produce complete plantlets having roots and shoots.

3. (Cancelled) The method according to claim 2, wherein the explant of living tissue is cut into cross-sectional segments before cultivation on a primary medium.

4. (Cancelled) The method according to claim 3, wherein the primary medium comprises a plant hormone and is capable of supporting the multiplication of the totipotent tissue.

5. (Currently amended) The method according to claim 1, ~~claim 4,~~ comprising, in addition:

moving the plantlets to ~~cultivation on~~ a tertiary medium which is free of added plant hormones ~~and which supports shoot elongation.~~

6. (Currently amended) The method according to claim 1, wherein the plant of the Class Monocotyledonae is ~~comprises a plant of~~ selected from the group consisting of *Juncus spp.*, *Scirpus spp.*, *Cyperus spp.*, *Carex spp.*, *Erianthus spp.*, and *Typha spp.*, *Cynodon dactylon*, *Digitaria sanguinalis*, *Erianthus giganteus*, *E. strictus*, *Miscanthus sinensis*, *Paspalum urvillei*, *Panicum dichotomum*, *Poa sp 1*, *Poa sp 2*, *Setaria gigantea*, *Sorghum halepense*, *Spartina alterniflora*, *S. cynosuroides*, *S. pectinata*, *S. spartinae*, *S. patens*, *Carex acuta*, *Carex*

~~sp 2, Cyperus esculentus, Cy. giganteus, Cy. haspan, Cy. iria, Cy. odoratus, Cy. pseudovegetus, Cy. retrorsa, Scirpus acutus, S. americanus, S. californicus, S. validus, Juncus articulatus, J. compressus, J. dichotomus, J. effusus, J. roemerianus, J. tenuis, Typha angustifolia, T. dominguensis, and T. latifolia.~~

7. (Currently amended) The method according to claim 1, ~~claim 3~~, wherein the explant comprises an inflorescence.

8. (Currently amended) The method according to claim 1, ~~claim 7~~, wherein the explant is an inflorescence is from a pre-flowering shoot with leaf sheaths completely enclosing the developing but still unemerged immature inflorescence.

9. (Cancelled) The method according to claim 2, wherein the primary medium and the secondary medium are solidified by the addition of a gelling agent that is selected from the group consisting of agar, agarose, Gellan gum, gelcarin, and mixtures thereof.

10. (Cancelled) The method according to claim 1, wherein the primary medium is a mineral nutrient medium supplemented with plant hormones, vitamins and a carbohydrate or a mixture of carbohydrates.

11. (Cancelled) The method according to claim 10, wherein sucrose is present in a concentration of about 30 g/l.

12. (Cancelled) The method according to claim 1 ~~claim 6~~, wherein the secondary medium and the tertiary medium are supplemented with sucrose.

13. (Cancelled) The method according to claim 12, wherein the sucrose in the secondary medium and the tertiary medium is present in a concentration of about 30 g/l.

14. (Cancelled) The method according to claim 10, wherein the plant hormone of the primary medium comprises an auxin and a cytokinin.

15. (Currently amended) The method according to claim 1 ~~claim 14~~, wherein the auxin of the primary medium comprises 2,4-dichlorophenoxyacetic acid, picloram, and indolebutyric acid and the cytokinin of the primary medium comprises thidiazuron, zeatin, and dimethylallyladenine.

16. (Cancelled) The method according to claim 2, wherein the plant hormone of the secondary medium comprises a cytokinin.

17. (Currently amended) The method according to claim 1, ~~claim 16~~, wherein the cytokinin in the secondary medium is ~~comprises~~ thidiazuron.

18. (Currently amended) The method according to claim 1 ~~claim 6~~, comprising the introduction of a heterologous gene into the totipotent ~~titopotent~~ tissue.

19. (Currently amended) The method according to claim 18, wherein the introduction of a heterologous gene is effected by cocultivation of the totipotent tissue with *Agrobacterium tumefaciens* that results in the transfer of one or more genes from *A. tumefaciens* to the totipotent ~~titopotent~~ tissue.

20. (Original) The method according to claim 18, wherein the introduction of a heterologous gene is effected by DNA transfer.

21. (Currently amended) The method according to claim 1, further comprising ~~A method for the micropropagation of a plant of the Class Monocotyledonae, the method comprising:~~

~~selecting an explant of living tissue from the plant.;~~

~~cultivating the tissue on a primary medium to produce a totipotent tissue culture;~~

~~cultivating the totipotent tissue on a secondary medium to produce complete plantlets having roots and shoots; and~~

~~acclimating the plantlets in soil.~~

22. (Original) The method according to claim 21, comprising the introduction of a heterologous gene into the totipotent tissue.

23. (Currently amended) The method according to claim 22, further comprising the use of the ~~wherein the plantlets are~~ transgenic plantlets ~~and the plantlets are used~~ for phytoremediation or in phytoreactors.

24. (Withdrawn) Totipotent tissue of a Monocotyledonae plant that is produced by the method of claim 1.

25. (Withdrawn) Transgenic totipotent tissue of a Monocotyledonae plant that is produced by the method of claim 18.

26. (Withdrawn) A plant of the Class Monocotyledonae that is produced by the method of claim 21.

27. (Withdrawn) A transgenic plant of the Class Monocotyledonae that is produced by the method of claim 22.

28. (Currently amended) The method according to claim 18, further comprising
~~A method for removal of an environmental pollutant from wastewater, the method~~
~~comprising:~~

providing at least 10 plants ~~from the Class Monocotyledonae~~ that possess the same genetic characteristics;
establishing the plants in a liquid medium; and
contacting the roots of the plants in the liquid medium with an environmental pollutant, thereby causing the environmental pollutant to be removed from the liquid medium.

29. (Cancelled) The method according to claim 28, wherein at least 1000 plants from the Class Monocotyledonae that possess the same genetic characteristics are provided.

30. (Currently amended) The method according to claim 21, further comprising
~~A method for bioremediation of an environmental pollutant from a land area, the method~~
~~comprising:~~

providing at least 10 plants ~~from the Class Monocotyledonae~~ that possess the same genetic characteristics; and
~~establishing the plants in soil;~~
~~and~~ contacting the roots of the plants with a land area that is contaminated with an environmental pollutant ~~the environmental pollutant in the land area,~~
thereby causing the environmental pollutant to be removed from the land area.

31. (Cancelled) The method according to claim 30, wherein at least 1000 plants from the Class Monocotyledonae that possess the same genetic characteristics are provided.

32. (New) The method according to claim 18, wherein the duration of the cocultivation of the totipotent tissue with *Agrobacterium tumefaciens* is about four days.

33. (New) The method according to claim 1, wherein the plant of the Class Monocotyledonae is selected from the group consisting of *Arundo donax*, *Cynodon dactylon*, *Digitaria sanguinalis*, *Erianthus giganteus*, *Erianthus strictus*, *Miscanthus sinensis*, *Paspalum urvillei*, *Panicum dichotomum*, *Setaria gigantea*, *Sorghum halepense*, *Spartina alterniflora*, *Spartina cynosuroides*, *Spartina pectinata*, *Spartina spartinae*, *Spartina patens*, *Carex acuta*, *Cyperus esculentus*, *Cyperus giganteus*,

Cyperus haspan, *Cyperus iria*, *Cyperus odoratus*, *Cyperuspseudovegetus*, *Cyperus retrorsa*, *Scirpus acutus*, *Scirpus americanus*, *Scirpus californicus*, *Scirpus validus*, *Juncus articulatus*, *Juncus compressus*, *Juncus dichotomus*, *Juncus effusus*, *Juncus roemerianus*, *Juncus tenuis*, *Typha angustifolia*, *Typha dominguensis*, and *Typha latifolia*.

34. (New) The method according to claim 1, wherein the plant is *Arundo donax*.

35. (New) The method according to claim 1, wherein the plant is selected from the group consisting of *Spartina alterniflora*, *Spartina cynosuroides*, *Spartina pectinata*, *Spartina spartinae*, and *Spartina. Patens*.

36. (New) The method according to claim 1, wherein the auxin of the primary medium is selected from the group consisting of 2,4-dichlorophenoxyacetic acid, picloram, and indolebutyric acid and the cytokinin of the primary medium is selected from the group consisting of benzyladenine, thidiazuron, zeatin, isopentyladenine, trans-zeatin, and dimethylallyladenine.

37. (New) The method according to claim 1, wherein the auxin of the primary medium comprises 2,4-dichlorophenoxyacetic acid and picloram, and the cytokinin comprises benzyladenine, zeatin and thiadiazuron.

38. (New) The method according to claim 1, wherein the auxin of the primary medium comprises 2,4-dichlorophenoxyacetic acid, indolebutyric acid, and picloram, and the cytokinin of the primary medium comprises adenine hemisulfate, isopentyladenine, trans-zeatin, and thiadiazuron.

39. (New) The method according to claim 38, wherein the plant hormones are present in the following amounts in the primary medium: 2,4-dichlorophenoxyacetic acid, 0.5 mg/l; indolebutyric acid, 1.0 mg/l; picloram, 0.12 mg/l; adenine hemisulfate, 80 mg/l; isopentyladenine, 0.5 mg/l; trans-zeatin, 0.5 mg/l; and thiadiazuron, 3 mg/l.

40. (New) The method according to claim 17, wherein the thiadiazuron is present at a concentration of 0.02 mg/l.

41. (New) A method for the production of totipotent tissue culture of a plant of the Class Monocotyledonae, the method comprising:

selecting an explant of living tissue from the plant;

cultivating the tissue on a primary medium which contains at least two different auxins and a cytokinin to produce totipotent tissue; and

transferring the totipotent tissue to a secondary medium containing a cytokinin and cultivating to produce plantlets having roots and shoots.

42. (New) The method according to claim 41, wherein the plant of the Class Monocotyledonae comprises a plant selected from the group consisting of *Juncus spp.*, *Scirpus spp.*, *Cyperus spp.*, *Carex spp.*, *Erianthus spp.*, and *Typha spp.*

43. (New) The method according to claim 41, wherein the plant of the Class Monocotyledonae is selected from the group consisting of *Arundo donax*, *Cynodon dactylon*, *Digitaria sanguinalis*, *Erianthus giganteus*, *Erianthus strictus*, *Miscanthus sinensis*, *Paspalum urvillei*, *Panicum dichotomum*, *Setaria gigantea*, *Sorghum halepense*, *Spartina alterniflora*, *Spartina cynosuroides*, *Spartina pectinata*, *Spartina spartinae*, *Spartina patens*, *Carex acuta*, *Cyperus esculentus*, *Cyperus giganteus*, *Cyperus haspan*, *Cyperus iria*, *Cyperus odoratus*, *Cyperuspseudovegetus*, *Cyperus retrorsa*, *Scirpus acutus*, *Scirpus americanus*, *Scirpus californicus*, *Scirpus validus*, *Juncus articulatus*, *Juncus compressus*, *Juncus dichotomus*, *Juncus effusus*, *Juncus roemerianus*, *Juncus tenuis*, *Typha angustifolia*, *Typha dominguensis*, and *Typha latifolia*.

44. (New) The method according to claim 41, wherein the plant is *Arundo donax*.

45. (New) The method according to claim 41, wherein the plant is selected from the group consisting of *Spartina alterniflora*, *Spartina cynosuroides*, *Spartina pectinata*, *Spartina spartinae*, and *Spartina. Patens*.

46. (New) The method according to claim 41, wherein the explant comprises an inflorescence.

47. (New) The method according to claim 46, wherein the explant is an immature inflorescence.

48. (New) The method according to claim 41, wherein the at least two auxins of the primary medium are selected from the group consisting of 2, 4-dichlorophenoxyacetic acid, picloram, and indolebutyric acid and the cytokinin of the primary medium is selected from the group consisting of benzyladenine, thidiazuron,

zeatin, isopentyladenine, trans-zeatin, and dimethylallyladenine.

49. (New) The method according to claim 41 wherein the auxin of the primary medium comprises 2, 4-dichlorophenoxyacetic acid, picloram, and indolebutyric acid and the cytokinin of the primary medium comprises thidiazuron, zeatin, and dimethylallyladenine.

50. (New) The method according to claim 41, wherein the auxin of the primary medium comprises 2,4-dichlorophenoxyacetic acid and picloram, and the cytokinin comprises benzyladenine, zeatin and thiadiazuron.

51. (New) The method according to claim 41, wherein the auxin of the primary medium comprises 2,4-dichlorophenoxyacetic acid, indolebutyric acid, and picloram, and the cytokinin of the primary medium comprises adenine hemisulfate, isopentyladenine, trans-zeatin, and thiadiazuron.

52. (New) The method according to claim 41, wherein the plant hormones are present in the following amounts in the primary medium: 2,4-dichlorophenoxyacetic acid, 0.5 mg/l; indolebutyric acid, 1.0 mg/l; picloram, 0.12 mg/l; adenine hemisulfate, 80 mg/l; isopentyladenine, 0.5 mg/l; trans-zeatin, 0.5 mg/l; and thiadiazuron, 3 mg/l.

53. (New) The method according to claim 41, wherein the cytokinin in the secondary medium is thidiazuron.

54. (New) The method according to claim 53, wherein the thiadiazuron is present at a concentration of 0.02 mg/l.

55. (New) The method according to claim 41, comprising the introduction of a heterologous gene into the totipotent tissue.

56. (New) The method according to claim 55, wherein the introduction of a heterologous gene is effected by cocultivation of the totipotent tissue with *Agrobacterium tumefaciens* that results in the transfer of one or more genes from *A. tumefaciens* to the totipotent tissue.

57. (New) The method according to claim 56, wherein the duration of the cocultivation of the totipotent tissue with *Agrobacterium tumefaciens* is about four days.

58. (New) The method according to claim 55, wherein the introduction of a heterologous gene is effected by DNA transfer.

59. (New) The method according to claim 41, further comprising acclimating

the plantlets in soil.

60. (New) The method according to claim 55, further comprising the use of the transgenic plantlets for phytoremediation or in phytoreactors.

61. (New) The method according to claim 55, further comprising:
providing at least 10 plants that possess the same genetic characteristics;
establishing the plants in a liquid medium; and
contacting the roots of the plants in the liquid medium with an environmental pollutant, thereby causing the environmental pollutant to be removed from the liquid medium.

62. (New) The method according to claim 55, further comprising:
providing at least 10 plants that possess the same genetic characteristics; and
contacting the roots of the plants with a land area that is contaminated with an environmental pollutant, thereby causing the environmental pollutant to be removed from the land area.